

## Claims

- [c1] What is claimed is:
- 1.A printer comprising:
    - a housing;
    - a track installed within the housing;
    - a carriage moveably installed on the track;
    - a print head installed on the carriage for ejecting ink onto a medium;
    - a position detecting mechanism comprising a first portion installed at a calibration position neighboring the track, and a second portion installed on the carriage; and
    - control circuitry for controlling operations of the printer and recording the calibration position at the track, the control circuitry comprising a counter for recording a counted position of the second portion of the position detecting mechanism;
    - wherein the calibration position is within a range which the print head is capable of printing the medium, and the second portion is capable of passing by the first portion when the print head simultaneously ejects ink onto the medium.
  - [c2] 2.The printer of claim 1 wherein the second portion comprises a light source and a light sensor installed on the carriage, the first portion comprising a shield installed on the housing for shielding light transmitted from the light source to the light sensor.
  - [c3] 3.The printer of claim 2 wherein a first edge of the shield corresponds to the calibration position neighboring the track; and when the light source and the light sensor on the carriage move to a position which the shield starts to shield the light transmitted from the light source to the light sensor, the control circuitry will compare the position of the light source and the light sensor corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions.
  - [c4] 4.The printer of claim 2 wherein a second edge of the shield corresponds to the calibration position of the track; and when the light source and the light sensor

on the carriage move to a position which the light sensor starts to receive the light transmitted from the light source again, the control circuitry will compare the position of the light source and the light sensor corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions.

[c5] 5.The printer of claim 1 wherein the first portion comprises a light source and a light sensor installed on the housing, the second portion comprising a shield installed on the carriage for shielding light transmitted from the light source to the light sensor.

[c6] 6.The printer of claim 5 wherein the light source and the light sensor correspond to the calibration position of the track; and when a first edge of the shield moves to a position which the shield starts to shield the light transmitted from the light source to the light sensor, the control circuitry will compare the position of the first edge of the shield corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions.

[c7] 7.The printer of claim 5 wherein the light source and the light sensor correspond to the calibration position of the track; and when a second edge of the shield moves to a position which the light sensor starts to receive the light transmitted from the light source again, the control circuitry will compare the position of the second edge of the shield corresponding to the track counted by the counter with the calibration position recorded by the control circuitry to obtain a difference of the two positions.

[c8] 8.The printer of claim 1 wherein when printing the medium, if a difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is within a first predetermined range, the control circuitry does not need to calibrate the position of the carriage.

[c9] 9.The printer of claim 8 wherein when printing the medium, if the difference between the position of the second portion corresponding to the track recorded

by the counter and the position of the calibration position at the track recorded by the control circuitry is between the first predetermined range and a second predetermined range, the control circuitry will calibrate the position of the carriage after the medium is printed.

[c10] 10. The printer of claim 9 wherein when printing the medium, if the difference between the position of the second portion corresponding to the track recorded by the counter and the position of the calibration position at the track recorded by the control circuitry is greater than the second predetermined range, the control circuitry will instantly stop printing the medium to calibrate the position of the carriage.

[c11] 11. The printer of claim 1 further comprising a step motor for driving the carriage wherein the counter counts rotational steps of the step motor to record the position of the second portion corresponding to the track.

[c12] 12. The printer of claim 1 further comprising:  
a DC motor for driving the carriage;  
an optical ruler installed on the housing;  
a light source installed on the carriage for emitting light toward the optical ruler; and  
a light sensor for detecting the light emitted by the light source through the optical ruler and generating corresponding position signals;  
wherein the counter uses the position signals generated by the light sensor to record the position of the second portion corresponding to the track.

[c13] 13. A printer comprising:  
a housing;  
a track installed within the housing;  
a carriage moveably installed on the track;  
a print head installed on the carriage for ejecting ink onto a medium;  
a position detecting mechanism comprising a first portion installed at a calibration position neighboring the track, and a second portion installed on the carriage, the calibration position being within a range the print head is capable of printing the medium, the second portion being capable of passing by the first

portion when the print head simultaneously ejects ink onto the medium; and control circuitry for controlling operations of the printer and recording the calibration position, the control circuitry having a counter for recording a counted position of the second portion of the position detecting mechanism; wherein when a difference between the counted position of the second portion and the calibration position recorded in the control circuitry is larger than a predetermined threshold, the control circuitry calibrates the position of the carriage.

[c14] 14.The printer of claim 13 wherein the second portion comprises a light source and a light sensor installed on the carriage, the first portion comprising a shield installed on the housing for shielding light transmitted from the light source to the light sensor.

[c15] 15.The printer of claim 13 wherein the first portion comprises a light source and a light sensor installed on the housing, the second portion comprising a shield installed on the carriage for shielding light transmitted from the light source to the light sensor.

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